

REMARKS

At the outset, the Examiner is thanked for the thorough review and consideration of the subject application. The Office Action of November 20, 2002 and the Advisory Action of March 3, 2003 have been received and contents carefully reviewed.

Claims 1-25 are pending, and independent claims 1, 10, 11, and 21-23 have been amended.

The Examiner rejected claims 1, and 19-21 as being unpatentable over Nelson (US Patent No. 4,147,581) in view of Chung et al. (US Patent No. 5,000,795), rejected claims 2, 7, 10, 22, and 25 as being unpatentable over Nelson (US Patent No. 4,147,581) in view of Chung et al. (US Patent No. 5,000,795) and Tittle (US Patent No. 4,886,590), rejected claims 3-6, 8, 9, 11-18, 23, and 24 as being unpatentable over Nelson (US Patent No. 4,147,581) in view of Chung et al. (US Patent No. 5,000,795), Jones (US Patent No. 3,869,313) and Tittle (US Patent No. 4,886,590).

Applicants respectfully assert that the prior art references, singly or in combination, do not teach or suggest all of the claim features of at least independent claims 1, 10, 11, and 21-23.

Claims 1 and 21

Claim 1 is allowable at least for the reason that claim 1 recites a combination of features including "...an etch bath having a bubble plate, the glass substrate immersed in the first etchant and the etch bath connected to the first tank and receiving the first etchant, the etch bath containing a residual etchant including a diluted etchant and residue material after

the glass substrate is etched with the first etchant, wherein a thickness of the glass substrate is uniformly reduced;...; ...wherein an etched thickness of the glass substrate is derived from the temperature of the first etchant, and wherein the total reaction energy is used as a reference ...”

Claim 21 is allowable at least for the reason that claim 21 recites a combination of features including “...an etch bath, the etch bath having a bubble plate generating nitrogen bubbles, the glass substrate immersed in the first etchant and the bubble plate connected to a nitrogen inlet pipe, the nitrogen inlet pipe connected to a nitrogen supply line, the etch bath connected to the first tank and receiving the first etchant, the etch bath containing a residual etchant including a diluted etchant and residue material after the glass substrate is etched with the first etchant, wherein a thickness of the glass substrate is uniformly reduced; ...wherein an etched thickness of the glass substrate is derived from the temperature of the first etchant, and wherein the total reaction energy is used as a reference ...”

Claims 1 and 21 recite “a connecting passage connecting the first and second tanks directly transferring the separated diluted etchant from the second tank to the first tank.”

Moreover, dependent claims 2-9, and 19 are believed to be allowable by virtue of their dependence on claim 1, which is believed to be allowable.

Therefore, Applicants assert that the combination of references fails to teach or suggest all of the claim elements, as is required to support *prima facie* obviousness.

Claims 10 and 22

Claim 10 is allowable at least for the reason that claim 10 recites a

combination of features *inter alia*:

a control unit measuring and receiving a signal indicating the temperature of the etchant from the temperature sensor and transmitting an etching termination signal to the etch bath when the temperature reaches a target temperature;

wherein an etched thickness of the glass substrate is derived from the temperature of the first etchant, and wherein the total reaction energy is used as a reference.

Claim 22 is allowable at least for the reason that claim 22 recites a

combination of features *inter alia*:

a control unit measuring and receiving a signal indicating the temperature of the etchant from the temperature sensor and transmitting an etching termination signal to the etch bath when the temperature reaches a target temperature;

wherein a reaction heat generated from etching the glass substrate changes the temperature of the etchant;

wherein an etched thickness of the glass substrate is derived from the temperature of the first etchant; and

wherein the total reaction energy is used as a reference.

Chung et al. and Tittle fail to cure the deficiencies of Nelson.

Moreover, dependent claim 20 is believed to be allowable by virtue of its dependence on claim 10, which is believed to be allowable.

Therefore, Applicants assert that the combination of references including Nelson, Chung et al. and Tittle fails to teach or suggest all of the claim elements, as is required to support *prima facie* obviousness.

Claims 11 and 23

Claim 11 is allowable at least for the reason that claim 11 recites a combination of features *inter alia*:

an etch bath having a bubble plate, the glass substrate immersed in the first etchant and the etch bath connected to the first tank receiving the first etchant and etching the substrate with the first etchant wherein a thickness of the glass substrate is uniformly reduced, the etch both producing a residual etchant including a diluted etchant and residue material as a result of etching the substrate;

a separation tank receiving the residual etchant from the etch bath and separating the diluted etchant from the residue material, the separation tank connected to the etch bath via an etchant outlet pipe, the separation tank directly transferring the separated diluted etchant to the first tank;

wherein an etched thickness of the glass substrate is derived from the temperature of the first etchant, and wherein the total reaction energy is used as a reference.

Claim 23 is allowable at least for the reason that claim 23 recites a combination of features *inter alia*:

an etch bath having a bubble plate generating nitrogen bubbles, the bubble plate connected to a first nitrogen inlet pipe, the glass substrate immersed in the first etchant and the nitrogen inlet pipe connected to a nitrogen supply line, the etch bath connected to the first tank receiving the first etchant and etching the substrate with the first etchant, wherein a thickness of the glass substrate is uniformly reduced, the etch both producing a residual etchant including a diluted etchant and residue material as a result of etching the substrate;

a separation tank receiving the residual etchant from the etch bath separating the diluted etchant from the residue material, the separation tank connected to the etch bath via an etchant outlet pipe, the separation tank directly transferring the separated diluted

etchant to the first tank;

wherein an etched thickness of the glass substrate is derived from the temperature of the first etchant, and wherein the total reaction energy is used as a reference.

Tittle and Jones et al. fail to cure the deficiencies of Nelson and Chung et al.

Moreover, dependent claims 12-18, 24, and 25 are believed to be allowable by virtue of their dependence on claims 11 and 23, which are believed to be allowable.

Therefore, Applicants assert that the combination of references fails to teach or suggest all of the claim elements, as is required for *prima facie* obviousness.

Therefore, Applicants respectfully request reconsideration of the claims rejected over the combination of Nelson, Chung et al., Tittle, and Jones et al.

In view of the foregoing Amendments and Remarks, Applicants respectfully submit that the application is in condition for allowance and early, favorable action is respectfully solicited.

If the Examiner deems that a telephone conference would further the prosecution of this application, the Examiner is invited to call the undersigned attorney at (202) 496-7371.

All correspondence should continue to be sent to the below-listed address.


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If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. §1.136, and any additional fees required under 37 C.F.R. §1.136 for any necessary extension of time, or any other fees required to complete the filing of this response, may be charged to Deposit Account No. 50-0911. Please credit any overpayment to deposit Account No. 50-0911. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

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